OYSTER INVESTIGATIONS: BACKGROUND, JUSTIFICATION AND OBJECTIVES

List of Projects

- Preparation of the book on oyster biology based on studies of structure, functions and requirements of the American oyster Crassostrea virginica.
- 2. Productivity and methods of cultivation of oysters in the waters of the Cape Cod area.
- Control of whelks, drills, and other predators of oysters in Cape Cod waters.

OYSTER INVESTIGATIONS: BACKGROUND, JUSTIFICATION AND OBJECTIVES

Sound knowledge of the biology, physiology and ecology of mollusks is the basis for successful management and development of shellfishery resources of the country. The need for such information regarding the oyster is particularly urgent because of the general decline in oyster production, widespread and unexplained mortalities of oysters in the Middle Atlantic and Northern States, depletion of oyster grounds by starfish and other predators and overfishing of public oyster bottoms. No handbook of this type is available in any language. The present knowledge of oyster biology is being summarized in a comprehensive book which is based on critical examination of the world literature and on original research conducted at Woods Hole Laboratory and in the field.

The oyster investigations consist of the following three projects:

- Preparation of the book on oyster biology based on studies of structure, functions and requirements of the American oyster, Crassostrea virginica.
- 2. Productivity and method of cultivation of oysters in the waters of Cape Cod area.
- Control of whelks, drills and other predators of oysters in Cape Cod waters.

SUMMARY CC .OL SCHEDULE

Investigation: Oyster Biological Deberatory: Noods Wole, Mass.

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*Total needed by Laboratory for Project in theusands of dollars.

Leastion Woods Hole Mass. Bretch Mile & File 18 18 Daise Jume 26, 1959 Pale No.

Research Project Outline

Title of Project: Preparation of the book on oyster biology based on studies of structure, Innctions and requirements of the American Cyster, Investigation Tatle: Crassostrea virginies Oyster Investigations

Investigation Chief: Paul S. Galtsoff

Project Leader: Paul S. Galtsoff Fishery Research Biologist OS-13

Name Title Grade

Assistants: (Tatle and Grade)

Ruth L. Von Arz., Illustrator, 32-9 Was employee (Pert-time) William N. Shaw, GS-7

Collaborators:

Need for Information: Information regarding syster biology and ecology is needed because of the general decline in syster production, widespread and unexplained mortalities of systers in the Middle Atlantic and Northern States, depletion of syster grounds by starfish and other predators and overfishing of public syster bottoms. No handbook of this type is available in any language.

Dijective: The objective of the proposed book is to present the needed information on cysters for the use of conservation officers, cyster growers, Public Health officers, and biologists engaged in cyster research.

Wethod of Procedure:

Phase 1: Preparation of detailed oyster bibliography. The work completed except for the addition of current items. The bibliography comprises several thousand subject and author cards of publications in English and eight foreign languages.

Phase 2: Leboratory studies of anatomy, histology, ultrastructure (electron microscopy) and physiology. All this work has been completed except the study of cyster development. Preparation of illustrations for the text (about 200 were made, 50 remain to be done.)

Phase 3: Writing of the text. Nine chapters are finished and ready for revue by the Editor.

Felles Phase is Corrections and changes suggested by the Editorial office, preparation 120 of an index. The entire book including phase is expected to be finished in 1961.

Method	$\circ f$	Procedure:	(Contid

Phase	3:
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Estimated Costs: Total	l Needed by Laborat	ory for Complete Project	52.9
	FY 1959	FY _1960	FY 1961
Personal Scrvices Other Expenses:	9.3	8.5	7.2
Within Project	2.1	1.3	3.1
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Lab. Total	11.4	9.8	10.3
Regional Office Mashington Office			
Total			
Recommended Source of F	(8	-K, Regular, Contributed	
Estimated Date of Compi	etion: Phase 1 FY	;Phase 2 RY;Phase 3	FY ; Project FY 61
Recommended by: Originator	- Lie de la company de la com		<u>Date</u>
Investigation Chief	Paul S. Galtsoff		
Laboratory Director		m	
Regional Director			
Branch Chief			
Approved by: Division Chief for Div	rector		

Remarks

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Location Woods Hole, Mass. Branch Marrie Fiscert S Dates A. 1959 File No.

Project Outline

Productivity and methods of cultivation of systems in the waters

Title of Project: of the Cape Cod area.

Investigation Title: Cycter Investigations

Investigation Chief: Paul S. Calteoff

Project Leader: William N. Show Fishery Research Biologist C5-7

Name Title Grade

Assistants: (Title and Grade)

Collaborators: Shellfish wardens of Chathan and Warehams oyster growers of the Chathan area.

Need for Information: The advantages of raft culture as a method of developing

Latent oyster resources in the Cape area has been demonstrated by previous

observations. Cysters kept above the bottom grow at a faster rate than those
on the bottom but the ecological factors affecting their growth are not known.

Objective: Principal ecological factors affecting reproduction and growth will be studied in order to determine potential productivity of cyster bottoms and device practical methods of their utilisation.

Method of Procedure:

Phase II Trouth Mid mortality of cysters kept at different elevations above bottom is measured at regular intervals. Two localities have been selected for comparative study; depending on facilities and personnel three places may be added for these studies. Initial observations in Cyster River show that this method of culture gives satisfactory results.

Phase 2: Principal ecological factors such as temperature, chemical composition of water and plankton content of tidal pends and rivers of Cape Cod will be studied for the purpose of determining their effect on productivity. Additional factors such as water movements, rate of flushing of estuaries etc. may be 3-12-50 studied if personnel and funds are available.

- Phase 3: Application of modern technique of seed production by various types of collectors will be studied with reference to their suitability to local conditions.

 Phase is Tabulation and analysis of data. Preparation of report for
- publications

Method of Procedure: (Contid)

Phas∈ 3:

Estimated Costs: Total	Needed by Labora	tory for Complete Proje	ct 27•5
	FY <u>1959</u>	FY <u>1960</u>	FY <u>1961</u>
Personal Services	3•5	4.9	8.5
Other Expenses: Within Project	0.4	0•5	1.6
Lab. Adm. & Ser.	tion to the season and the season an		
Lab. Total	3•9	5• l ;	10.1
Regional Office Washington Office			
Total			
Recommended Source of Fu		S-K, Reguler, Centribut	ped, (tc.)
Estimated Date of Comple	tion: Phase 1 FY	;Phase 2_FY;Phase	3 FY ; Project IY 61
Recommended by: Originator			<u>Date</u>
Investigation Chief	Faul S. Galtsofi		
Laboratory Director	Herbert W. Graha	am	
Regional Director			
Branch Chief	· · · · · · · · · · · · · · · · · · ·		
Approved by: Division Chief for Dire	ector		

Remarks

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	Research	_Project C	Outline		
Title of Project:		s, drills, a s Cod waters	nd other pre	dators of cyster	B
Investigation Title	: Oyster Inv	estigations	Signingston, wheelp the Representation of the Property of the		
Investigation Chief	Paul S. Calto	net t		allegensystem also in the garage stages in the garage state in the consideration and the garage stage.	
Project Leaders Will Assistants: (Title		Fishery Res	earch Biolog Title	iet (18-7 Grade	

Collaborators: Shellfish wardens of Chathan and Warehens oyeter growers of the Chathan area.

Need for Information: Cultivation of oysters in Cape Cod waters has been a failure because of predation by whelks, drills, and other invertebrates. By using wooden traps the majority of the channeled whelks can be removed from the cyster bottoms. There is a need of improving the methods of control of this and other species, particularly the knobbed whelks, drills and flat worms.

Objective: To develop practical methods of controlling predators suitable to local conditions.

Method of Procedure:

Phase II Behavior of whelks and other enemies will be studied in order to improve the technique of using traps and other means of controlling these pests. Traps for estehing channeled whelks proved to be efficient but information is needed concerning the time, location and manner in which they should be used for effective results.

Phase 2: The use of mechanical and shandcal barriers in preventing the infestation of cyster grounds will be studied in the areas where experimental rafts are anchored.

Phase 3: Tabulation and analysis of data. Preparation of report for 3-12-59 publication.

Shoet No. 2

File No.:

Oysters 3

Method of Procedure: (Cont'd)

Phase 3:

Estimated Costs: Total	. Needed by Laborato	ry for Complete Project	12.1
	FY <u>1959</u>	FY <u>1960</u>	fy 1961.
Personal Services	2•0	1.9	<u>†</u> •0
Other Expenses: Within Project	0•4	0.4	1.6
Lab. Adm. & Ser.			
Lab. Total	2.4	2.3	5.6
Regional Office Washington Office			
Total			
Recommended Source of Fu		K, Rogular, Contributed,	(tc.)
Estimated Date of Comple	tion: Phase 1 FY	;Phase 2 FY ;Phase 3 FY	: Project IY 61
Recommended by: Originator			<u>Date</u>
Investigation Chief	Paul S. Galtsoff		
Laboratory Director	Herbert W. Graha	am .	
Regional Director	<u> </u>		
Branch Chief			, <u></u>
Approved by: Division Chief for Dir	ector		

Remarks

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